ADAPTIVE MODELING OF WAVE PROPAGATION IN HETEROGENEOUS ELASTIC MATERIALS

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We extend the concept of Hierarchical Adaptive Modeling to the elastodynamic case of wave propagation in heterogeneous elastic materials. The adaptive process involves an iterative modeling scheme where the wave problem is solved in the complex-valued frequency or Fourier space and where the modeling error in the local average stress is evaluated by means of residual-based *a posteriori* error estimates. To enable control of the modeling error, we introduce error indicators for nonlocal model adaptation, required due the hyperbolic character of the wave equation. One-dimensional steady state and transient numerical verifications are presented.